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No. 3

RESEARCH AID

THE SOVIET MARITIME DRY CARGO FLEET: ITS EXPANSION AND PERFORMANCE 1950-57 AND PLANS THROUGH 1960

CIA/RR RA-39
19 September 1958

CENTRAL INTELLIGENCE AGENCY

OFFICE OF RESEARCH AND REPORTS

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4 February 1959

MEMORANDUM TO: Holders of CIA/RR 125, Construction and Imports of Vessels for the Soviet Maritime Fleet, 1946-60, and of CIA/RR RA-39, The Soviet Maritime Dry Cargo Fleet: Its Expansion and Performance, 1950-57, and Plans Through 1960

The following statement has been prepared to explain an apparent discrepancy in the estimated volume of dry cargo vessels built and imported by the USSR as reported in the subject reports.

The estimates in RR 125 include all the maritime types of vessels constructed and imported by the USSR, regardless of ultimate assignment. Intelligence has shown that some of these vessels were allocated for service outside the maritime fleet as naval auxiliaries, research vessels, cable layers, and the like immediately upon delivery from the shipbuilding yard or after a period of service with the maritime fleet.

RA-39, for its part, shows the estimated number and volume (in gross register tons -- grt -- and in cargo carrying capacity in tons) of dry cargo vessels of more than 1,000 grt, built and imported by the USSR and actually assigned to the oceangoing maritime fleet (excluding the Caspian Sea and Danube River fleets). Therefore, all references in RA-39 to vessels built or imported by the USSR for the maritime fleet exclude maritime types of vessels which were assigned to other services either immediately upon delivery from the shipbuilding yard or which were withdrawn from the maritime service during the earlier years covered by the report. These references, however, do include some vessels which were withdrawn from maritime service in the later years covered by the report.

In both reports the lack of firm intelligence precludes an exact listing of vessels assigned outside the oceangoing fleet of the Soviet Ministry of the Maritime Fleet.

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RESEARCH AID

THE SOVIET MARITIME DRY CARGO FLEET: ITS EXPANSION AND PERFORMANCE 1950-57 AND PLANS THROUGH 1960

CIA/RR RA-39

(ORR Project 43.1955)

CENTRAL INTELLIGENCE AGENCY

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FOREWORD

This research aid deals with the maritime segment of the dry cargo fleet of the Soviet Ministry of the Maritime Fleet. The segments of the Ministry's dry cargo fleet operating on the Danube River, on the Caspian Sea, and on certain rivers in Central Asiatic USSR are considered also but only in order to obtain the figures for the maritime dry cargo fleet. The expansion of the fleet in 1951-60, its disposition as of 31 December 1957, and its performance in terms of both volume of cargo and cargo turnover are discussed. Volume of cargo is broken down by type of cargo and by shipments in coastal, intercoastal, and foreign trade navigation.

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THE SOVIET MARITIME DRY CARGO FLEET: ITS EXPANSION AND PERFORMANCE 1950-57 AND PLANS THROUGH 1960*

Summary

The Soviet maritime dry cargo fleet** made significant advances in both expansion and performance from 1950 through 1957. Nevertheless, dependence of the USSR on chartered Free World vessels to carry a portion of its seaborne foreign trade increased during these years. Consequently the USSR is placing increased emphasis on expanding the role of Soviet ships in carrying its seaborne foreign trade. Plans for the 1958 navigation season included for the first time recommendations that vessels be diverted from coastal to foreign trade navigation, and a large part of the planned acquisition of vessels is for employment in foreign trade navigation.

The performance of the maritime dry cargo fleet improved from 1950 to 1957. Cargo turnover increased from 25.0 billion to 45.0 billion ton-kilometers (tkm), and the volume of cargo increased from 14.2 million to 28.3 million metric tons.*** The 1957 volume of cargo consisted of the following: 29.7 percent, coal; 23.3 percent, timber; 21.6 percent, ore; and 25.4 percent, other cargo. According to class of navigation, the volume of cargo consisted of the following: 72.8 percent, coastal cargo; 24.7 percent, foreign trade cargo; and 2.5 percent, intercoastal cargo. The result of a drive to shift domestic cargoes from rail transport to maritime transport was that through 1957 the percentage shares of coastal and intercoastal cargoes rose at the expense of the share of foreign trade cargo. Although the original goals of the Sixth Five Year Plan (1956-60) indicate that this trend will continue through 1960, it is possible that a new program included among the plan goals for the 1958 navigation season will lead to an increase in the share of foreign trade cargo. The aim of this program is to shift cargoes currently carried by the maritime dry cargo fleet in coastal and intercoastal navigation to mixed rail and inland water shipment and thereby to release maritime cargo capacity for the carrying of foreign trade cargoes. It is not yet clear whether this program

* The estimates and conclusions in this research aid represent the best judgment of this Office as of 1 June 1958.

** Comprising all of the dry cargo and passenger-cargo (combination vessels carrying up to 125 passengers) vessels of more than 1,000 gross register tons (GRT) subordinate to the Ministry of the Maritime Fleet (Ministerstvo Morskogo Flota -- MMF) except those assigned to the Danube, Central Asiatic, Caspian, and Caspian Roadstead steamship companies.

*** Unless otherwise indicated, tonnages are given in metric tons throughout this research aid.

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implies abandonment or subordination of the drive to shift cargoes from rail transport to maritime navigation.

This new program reflects the over-all policy of increasing the role of Soviet vessels in Soviet seaborne foreign trade navigation. This trade grew very rapidly between 1950 and 1957 and resulted in an increased Soviet dependence on chartered Free World dry cargo vessels. In 1950, Soviet vessels carried 64 percent of the total volume of Soviet dry cargo in foreign trade navigation; in 1957, they carried less than 40 percent.

The improvement in performance of the maritime dry cargo fleet between 1950 and 1957 was largely the result of the acquisition of new vessels. As a result of these acquisitions the size of the fleet rose from 350 vessels totaling 1,213,000 GRT in 1950 to 521 vessels totaling 1,707,840 GRT in 1957. The average age of the vessels in the fleet fell from 26.6 years in 1950 to 18.5 years in 1957. There are noticeable differences in both quantity and quality between the vessels acquired during the Fifth Five Year Plan (1951-55) and those acquired during the first 2 years of the original Sixth Five Year Plan. During the Fifth Five Year Plan, deliveries averaged 24 vessels a year, all purchased in the European Satellites and Western Europe. These deliveries consisted largely of vessels of less than 3,000 GRT, so that the small average size of the vessels in the fleet was only slightly affected. During the first 2 years of the original Sixth Five Year Plan, 1956 and 1957, the annual rate of deliveries of vessels rose to 40. These deliveries included Soviet-built vessels for the first time since the war and also included a considerably higher percentage of vessels of more than 3,000 GRT.

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I. Introduction.

At the end of 1950 the Soviet maritime dry cargo fleet numbered 350 vessels totaling 1,213,000 GRT.* With the exception of 37 World War II Liberty ships from the US and a number of modern vessels acquired as reparations from Germany, a majority of these vessels were small (75 percent were less than 5,000 GRT) and slow (more than 90 percent were capable of only 12 knots or under). A large percentage were more than 20 years old. 3/

The cost of operating so many inefficient units in the maritime fleet as a whole was one of a number of incentives for the expansion or replenishment of the fleet with more modern vessels. A second was the performance of the fleet measured in ton-kilometers (see Table 6**), which in 1950 was still slightly below the highest level reached before World War II, 25.4 billion in 1936. 4/ A third important incentive is shown in the announced goal of the Fifth Five Year Plan to increase the volume of coastal navigation and thereby to reduce transportation costs by shifting long-haul bulk cargoes from the railroads to the maritime fleet. 5/ This emphasis was continued in the original Sixth Five Year Plan, which set as a goal increasing the maritime percentage share of the total Soviet transportation turnover from 6.2 percent in 1955 to 8.7 percent in 1960. 6/ One Soviet writer estimated that in 1956 as many as 2.5 million tons of coal could be shifted from rail transport to maritime transport in the Azov - Black Sea area alone. He also stated that as many as 500,000 tons of dry cargo could be shifted in 1 year from the Trans-Siberian Railroad to maritime dry cargo vessels operating between the Black Sea and the Soviet Far East. 7/ Such a shift apparently was contemplated because the volume of the Black Sea Steamship Company's intercoastal shipments of dry cargo (principally to the Soviet Far East) was planned to increase 4.5 times during the Sixth Five Year Plan. 8/

A fourth incentive for expansion of the maritime dry cargo fleet was the dependence of the USSR on chartered Western vessels to carry a part of its seaborne dry cargoes in foreign trade navigation. This dependence was not nearly so great in 1950 when the volume of these cargoes amounted

* This figure was obtained as follows: a 1957 ONI figure was used as a base. 1/ (For serially numbered source references, see Appendix D.) By subtracting refrigerator vessels of the Ministry of the Fishing Industry from this figure and adding 13 passenger-cargo vessels, the size of the fleet in 1957 was established as 521 vessels totaling 1,707,840 GRT. 2/ Acquisitions made during 1951-57 were then subtracted. (See II, A, and II, B, below.) Assuming an annual rate of loss and retirement of 5 vessels totaling 15,000 GRT, the vessels presumed to have been retired and lost during 1951-57 were then added to arrive at a corrected figure for 1950.

** P. 14, below.

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to about 9 million tons and Soviet vessels were still carrying more than 64 percent of the total. By the beginning of the Sixth Five Year Plan, however, this volume had increased to almost 16 million tons, and the share carried in Soviet bottoms had dropped to less than 40 percent.*

This increasing dependence on chartered Western vessels naturally cut into the limited Bloc holdings of foreign exchange. For this and other reasons the expansion of the role of the Soviet maritime fleet in the carrying of Soviet foreign trade was included among the goals of the Sixth Five Year Plan and by the end of 1957 had become the primary incentive for expansion of the fleet. 10/ Although of lesser importance, the increasing employment of Soviet vessels in foreign trade navigation between foreign ports also was stressed because of the resultant income in foreign exchange and the utilization of vessels at times when they would otherwise have been empty. 11/ The emphasis on expansion of the fleet in order to increase the volume of shipments in foreign trade was accompanied by a deemphasis on the expansion of the volume of coastal shipments. The steamship lines were encouraged to release vessels from coastal navigation so they could be used in foreign trade navigation, and it was specifically suggested in Vodnyy transport, the official organ of the Ministry of the Maritime Fleet (MMF), that cargoes currently shipped along the Northern Sea Route be shifted to mixed rail and inland water transport. 12/

II. Expansion of the Fleet, 1951-60.

A. Fifth Five Year Plan (1951-55).

During the Fifth Five Year Plan, 122 new vessels totaling 297,000 GRT and 4 used Free World vessels totaling 16,717 GRT were added to the Soviet maritime dry cargo fleet, increasing its size to 451 vessels totaling 1,451,000 GRT.** All but 5 of the 122 vessels were of less than 4,000 GRT,

* Figures on volume were obtained by subtracting volumes of dry cargo carried on the Danube (assumed to consist entirely of import-export cargoes) in Table 5, p. 13, below, from total volume of seaborne Soviet import-export dry cargoes. The latter volumes were obtained by calculations based on statements in a recent Soviet maritime journal relating to the total volume of Soviet seaborne imports and exports and an estimate of the breakdown of this volume between dry cargoes and POL. 9/ The shares carried by the Soviet maritime dry cargo fleet are shown in column 2, Table 7, p. 16, below.

** Obtained by subtracting the acquisitions made in 1956-57 (see B, below) from the 1957 totals and adding the estimated losses and retirements in 1956-57 (at the rate of 5 vessels totaling 15,000 GRT per year).

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and all were built outside of the USSR, in both Western European and Satellite shipyards. (See Tables 1, 2, and 3.*) Because of the concentration of the limited shipbuilding capacity of the USSR on naval construction and the retarded development of powerplant technology, the only sizable maritime cargo vessels to be produced in the USSR during this period were the 8,200-GRT Kazbek-class tankers.

B. Sixth Five Year Plan (1956-60).

Deliveries of vessels to the Soviet maritime dry cargo fleet during 1956 and 1957 and deliveries planned for the remaining years of the original Sixth Five Year Plan differ considerably in both quantity and quality from deliveries during the Fifth Five Year Plan. The total planned tonnage is close to 3 times as great, many vessels of larger size are included (see Table 3**), and the 3 most important types are to be Soviet built.

At the end of 1957 the size of the maritime dry cargo fleet had reached 521 vessels totaling 1,707,840 GRT.*** Deliveries made in 1956-57 consisted of 80 vessels totaling 287,000 GRT and having a combined cargo-carrying capacity of 353,000 tons. All but one of these were new vessels. 13/ (See Tables 1, 3, and 4.****) After adding to this the figure for deliveries to the Danube and Caspian dry cargo fleets, the total is still less than two-fifths of the 1,114,000 tons of cargo-carrying capacity scheduled for delivery to the MMF during the whole 5-year plan period. 14/ There should, however, be little difficulty in meeting the goal if annual deliveries increase after 1957 at the same rate they increased before 1957.

The 3 types of dry cargo vessels planned for construction in Soviet yards are as follows: the 5,500-GRT GES series, which has been in production at Nikolayev since 1956; the 8,000-GRT (estimated) Metallurg Anosov series, which went into production late in 1957 at Kherson; and the 7,700-GRT (estimated) revised version of the Dutch-built icebreaker-cargo vessels, which was scheduled to go into production at Nikolayev some time during 1957. 15/

In addition to these Soviet-built vessels,† planned deliveries for the last 3 years of the plan period include the following: additional 2,400- and 5,600-GRT vessels from Finland, additional 2,600- and 3,800-GRT vessels from Poland, a new 7,000-GRT (estimated) vessel from Poland, and a new 4,500-GRT (estimated) collier from East Germany. 16/

* Tables 1, 2, and 3 follow on pp. 6, 7, and 8, respectively, below.
** P. 8, below.
*** See the footnote on p. 3, above.
**** Table 4 follows on p. 11, below.
† It has not been definitely established that production of the 5,500-GRT GES class will continue after 1 January 1958.

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Table 1

New Vessels of More Than One Thousand Gross Register Tons
Delivered to the Soviet Maritime Dry Cargo Fleet, by Tonnage a/
1951-57

Gross Register Tons	1951		1952		1953		1954		1955		1956		1957		Total	
	Number of Vessels	Weight (Gross Register Tons)	Number of Vessels	Weight (Gross Register Tons)	Number of Vessels	Weight (Gross Register Tons)	Number of Vessels	Weight (Gross Register Tons)	Number of Vessels	Weight (Gross Register Tons)	Number of Vessels	Weight (Gross Register Tons)	Number of Vessels	Weight (Gross Register Tons)	Number of Vessels	Weight (Gross Register Tons)
1,000 to 1,999	10	14,810	16	24,103	15	24,226	15	25,541	6	8,367	11	15,692	3	4,981	76	117,720
2,000 to 2,999	4	9,365	4	9,431	9	23,346	8	20,392	5	12,738	8	20,828	9	23,573	47	119,673
2,000 to 3,999			1	3,858	5	18,608	9	32,125	10	35,927	12	44,596	17	63,679	54	198,793
4,000 to 4,999													1	4,180	1	4,180
5,000 to 5,999			1	5,660					1	5,585	9	51,261	6	33,014	17	95,520
6,000 to 6,999																
7,000 to 7,999							3	22,550					3	22,983	6	45,533
Total	14	24,175	22	43,052	29	66,180	35	100,608	22	62,617	40	132,377	39	152,410	201	581,419

a. 17/

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Table 2

New Vessels of More Than One Thousand Gross Register Tons
Delivered to the Soviet Maritime Dry Cargo Fleet, by Country of Origin a/
1951-57

Country of Origin	1951		1952		1953		1954		1955		1956		1957		Total	
	Number of Vessels	Weight (Gross Register Tons)	Number of Vessels	Weight (Gross Register Tons)	Number of Vessels	Weight (Gross Register Tons)	Number of Vessels	Weight (Gross Register Tons)	Number of Vessels	Weight (Gross Register Tons)	Number of Vessels	Weight (Gross Register Tons)	Number of Vessels	Weight (Gross Register Tons)	Number of Vessels	Weight (Gross Register Tons)
Finland	4	9,365	5	15,091	5	12,304	5	12,334	4	13,000	4	12,117	4	14,808	31	89,019
Belgium	3	5,700	2	3,612			5	8,808	2	3,549	4	8,577	3	9,964	19	40,210
Netherlands							3	22,550					3	22,983	6	45,533
France											6	34,755			6	34,755
Poland	1	1,946	6	13,598	16	42,218	14	39,113	8	28,218	16	54,257	24	81,468	85	260,818
Hungary	6	7,164	9	10,751	7	8,400	4	4,800	4	4,818	7	8,425	1	1,211	38	45,569
East Germany					1	3,258	4	13,003	4	13,032	1	3,258			10	32,551
USSR											2	10,988	4	21,976	6	32,964
Total	14	24,175	22	43,052	29	66,180	35	100,608	22	62,617	40	132,377	39	152,410	201	581,419

a. See Table 1, p. 6, above.

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Table 3

Characteristics of Types of Vessels Scheduled for Delivery to the Soviet Maritime Dry Cargo Fleet 1951-60

Country	Class	Gross Register Tons a/	Cargo-Carrying Capacity (Metric Tons)	Calculated Length (Feet)	Beam (Feet)	Draft Loaded (Feet)	Propulsion	Number of Engines	Horsepower per Engine	Fuel	Maximum Speed (Knots)
First delivered 1951-55											
Hungary	Tissa	1,200 b/	1,500	216	33	13	Diesel	2	400	Oil	9.0
Belgium		1,700 c/	3,100	287	44	18	Diesel	1	1,700	Oil	12.0
Belgium	Nikolay Ostrovskiy	1,800 d/	3,100	309	47	19	Diesel	1	2,400	Oil	13.5
Poland	Pervomaysk	1,900 e/	2,500	276	41	18	Steam reciprocating	1	1,000	Coal	11.0
Finland	Khasan	2,400 f/	3,200	279	43	18	Steam reciprocating	1	1,000	Coal	10.0
Poland	Chulym	2,600 g/	3,800	296	44	18	Steam reciprocating	1	1,700	Coal	12.0
East Germany	Kolomna	3,200 h/	4,500	314	47	20	Diesel	N.A.	N.A.	Oil	12.3
Poland	Donbass	3,800 i/	4,800	332	48	21	Steam reciprocating	1	1,700	Coal	12.5
Finland	Arkhangel'sk	5,600 j/	7,200	432	58	25	Diesel	1	7,400	Oil	17.4
Netherlands	Lena	7,500 k/	7,600	396	62	27	Diesel electric	4	2,050	Oil	14.2
First delivered 1956-57											
Finland	Furmanov	1,800 l/	3,100	308	46	19	Diesel	1	2,400	Oil	13.5
Belgium	Stanislavskiy	3,200 m/	5,000	358	55	24	Diesel	N.A.	N.A.	Oil	12.1
France		5,800 n/	6,200	395	55	23	Steam turbine	1	4,500	Mazut	14.6
USSR	GES	5,500 o/	5,000	386	55	25	Diesel electric	4	1,800	Oil	16.0
Under construction 31 December 1957											
East Germany		4,500 (estimated) p/	6,300	412	56	25	Diesel	1	4,700	Oil	14.5
USSR		7,700 (estimated) q/	7,500	N.A.	N.A.	N.A.	Diesel electric	4	1,800	Oil	15.0
Poland		7,000 (estimated) r/	9,800	N.A.	N.A.	N.A.	Diesel	N.A.	N.A.	N.A.	N.A.
USSR	Metallurg Anosov	8,000 (estimated) s/	10,000 to 13,000	510	71	32	Steam turbine	1	13,000	Mazut	18.5

a. In most cases within 100 tons.
b. 18/
c. 19/
d. 20/
e. 21/
f. 22/
g. 23/
h. 24/
i. 25/
j. 26/
k. 27/
l. 28/
m. 29/
n. 30/
o. 31/
p. 32/
q. 33/
r. 34/
s. 35/

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C. Effects Through 31 December 1957.

The deliveries made in the period 1951-57 led to the improvement of certain characteristics of the Soviet maritime dry cargo fleet. The average age of the vessels in the fleet fell from 26.6 to 18.5 years, and the average speed per vessel rose from 7.8 to 8.7 knots. 36/

III. Disposition of the Fleet.

From the beginning of 1951 to the end of 1957, there were only slight changes in the distribution of the Soviet maritime dry cargo fleet among the four major sea basins of the USSR. The breakdown below shows the percentages of the gross register tonnage of the whole fleet assigned to each basin during 1957.* 37/

Basin	Percentage Share
Far Eastern	50
Baltic Sea	25
Black Sea	15
Arctic	10
Total	100

An important aspect of the disposition of the fleet not revealed in the above distribution is the activity of vessels outside of the major Soviet sea basins on voyages in intercoastal and foreign trade navigation. The tonnage of vessels utilized on such voyages has been increasing although the percentage share has been decreasing. This fact is reflected in the changes occurring in the distribution of the volume of cargo among coastal, intercoastal, and foreign trade navigation.** A compilation of Soviet maritime dry cargo vessels in 1955 reveals that more than one-third of the fleet, 139 vessels, totaling 516,890 GRT, was active outside of its home waters. Of these vessels, 5 were active only in intercoastal navigation, 73 were active only in foreign trade navigation, and 61 were active in both intercoastal and foreign trade navigation. 38/

* Rounded to the nearest 5 percent.
** See p. 15, below.

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IV. Performance of the Fleet.

Both the expansion of the Soviet maritime dry cargo fleet and the increasing employment of vessels in intercoastal and foreign trade navigation are reflected in the actual and planned performance of the maritime dry cargo fleet during the years 1950-60.

For the purposes of this report, the performance of the maritime dry cargo fleet is considered to include the volume of cargo moved by the fleet, measured in metric tons, and the cargo turnover* of the fleet, measured in ton-kilometers. The accompanying charts, Figures 1 and 2,** show the shares of the cargo volume and turnover of the MMF, including dry cargo, POL, and rafted timber, which the maritime dry cargo fleet contributed during the period 1950-57 and plans to contribute during the period 1958-60. In the case of cargo turnover this share represented 63.0 percent in 1950; if plans for 1960 are realized, the share will drop to 39.0 percent. In the case of volume of cargo change in the share will be from 42.1 to 43.8 percent. This apparent paradox actually reflects a planned change in the employment of the tanker fleet rather than a change in the size of the maritime dry cargo fleet. The tanker fleet is involved to a greater extent in plans of the MMF for increased navigation in intercoastal and foreign trade, both of which involve longer hauls than are involved in coastal trade. This situation is clearly reflected in comparison of average lengths of haul for the maritime dry cargo and tanker fleets in 1950-60. If the original plan goals for 1960 are realized, the average length of haul of the maritime dry cargo fleet will have changed very little since 1950, having remained at about 1,500 kilometers (km); that of the tanker fleet will have risen from about 750 km to 2,300 km. 39/ This change in the relative average lengths of haul will cause the share of POL in the turnover to rise at the expense of the share of maritime dry cargo, although the relative shares of each in the total MMF volume of cargo will have changed only slightly. During 1950-57, the volume of maritime dry cargo increased 99.3 percent -- from 14.2 million to 28.3 million tons; cargo turnover increased 80.0 percent -- from 25.0 billion to 45.0 billion tkm. By 1960, the volume of cargo is planned to reach 35.0 million tons and the cargo turnover 56.5 billion tkm. (See Tables 5 and 6.***)

There are sufficient Soviet data available to make possible two important breakdowns of the volume of maritime dry cargo, one among coastal,****

* The cargo turnover is equal to the sum of the products of the cargoes moved times the distances they were moved, or to the product of the volume of cargo times the average length of haul per ton of cargo.

** Following p. 10.

*** Tables 5 and 6 follow on pp. 13 and 14, respectively, below.

**** Text continues on p. 15.

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Figure 1

Volume of Cargo Carried by the Soviet Ministry of the Maritime Fleet Showing the Share Carried by the Maritime Dry Cargo Fleet 1950-57 and Plans for 1958-60

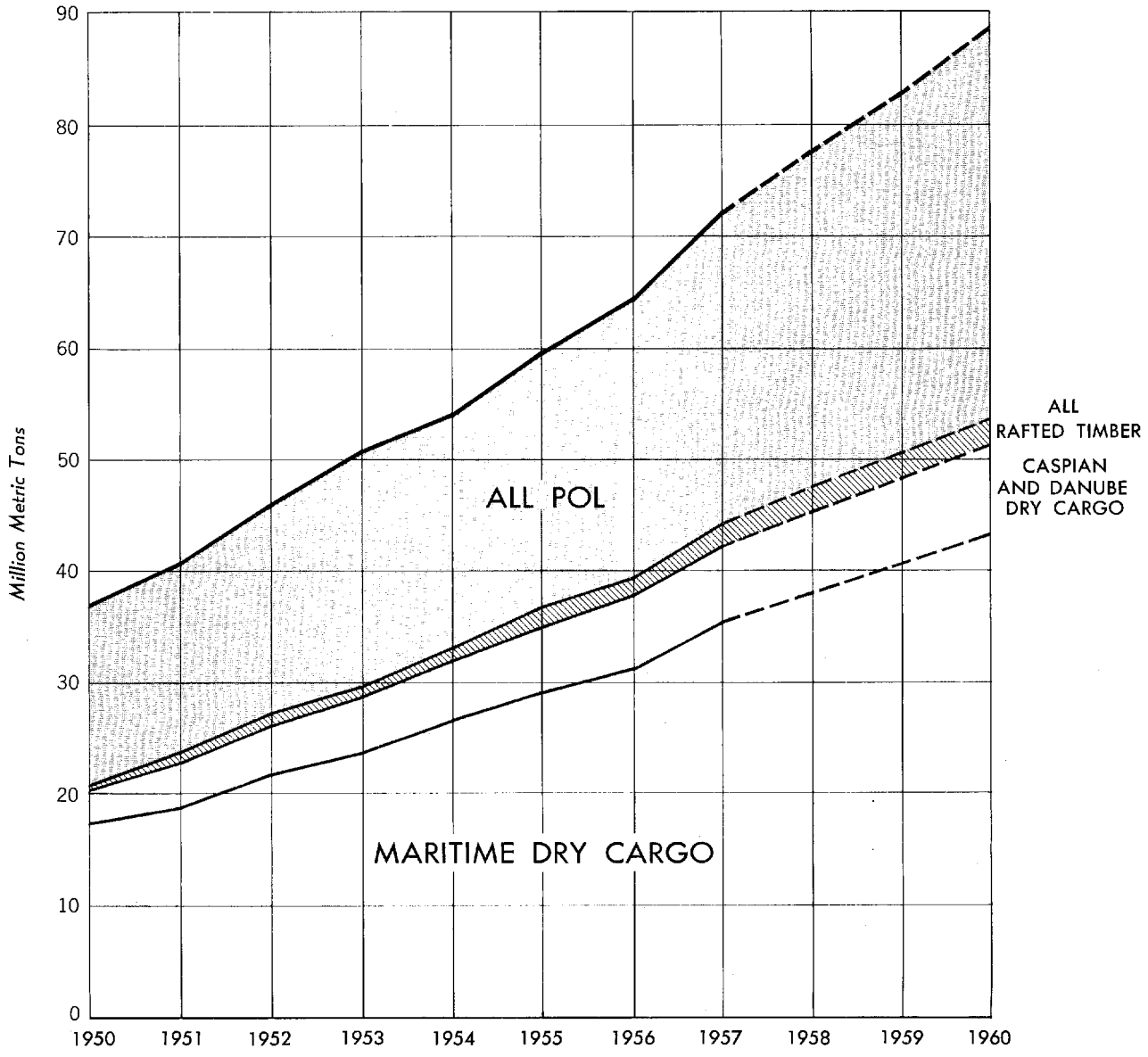

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Figure 2

Cargo Turnover of the Soviet Ministry of the Maritime Fleet Showing the Share Performed by the Maritime Dry Cargo Fleet 1950-57 and Plans for 1958-60

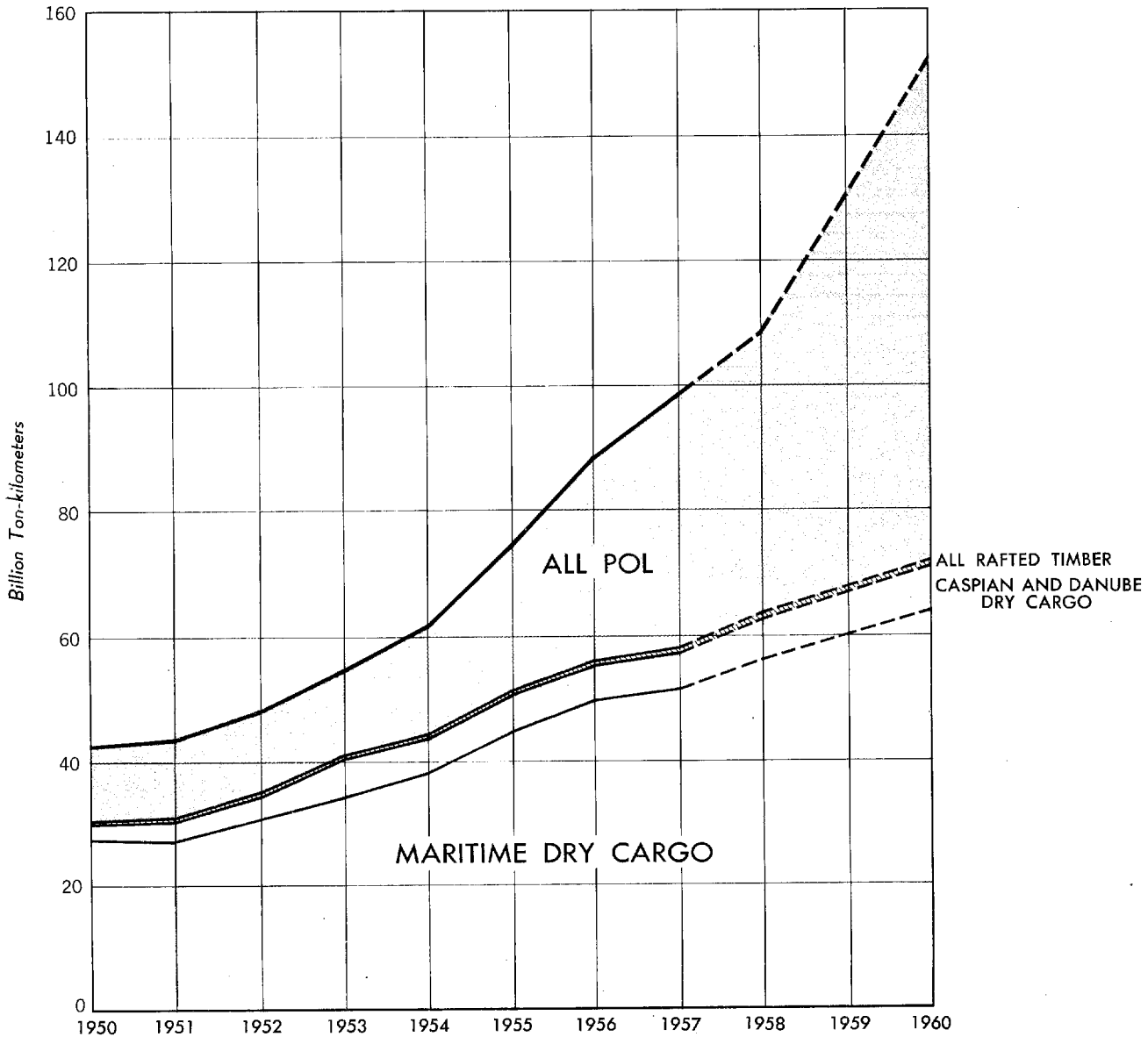

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Table 4

Cargo-Carrying Capacity of Series-Built Dry Cargo Vessels Delivered to the Soviet Maritime Dry Cargo Fleet a/
1951-57

Country	Class	Gross Register Tons b/	Cargo-Carrying Capacity (Metric Tons)	1951 Number of Vessels	1951 Cargo-Carrying Capacity (Metric Tons)	1952 Number of Vessels	1952 Cargo-Carrying Capacity (Metric Tons)	1953 Number of Vessels	1953 Cargo-Carrying Capacity (Metric Tons)	1954 Number of Vessels	1954 Cargo-Carrying Capacity (Metric Tons)	1955 Number of Vessels	1955 Cargo-Carrying Capacity (Metric Tons)	Total 1951-55 Number of Vessels	Total 1951-55 Cargo-Carrying Capacity (Metric Tons)	1956 Number of Vessels	1956 Cargo-Carrying Capacity (Metric Tons)	1957 Number of Vessels	1957 Cargo-Carrying Capacity (Metric Tons)	Total 1956-57 Number of Vessels	Total 1956-57 Cargo-Carrying Capacity (Metric Tons)	Total 1951-57 Number of Vessels	Total 1951-57 Cargo-Carrying Capacity (Metric Tons)
Fifth Five Year Plan (1951-55)																							
Hungary	Tissa	1,200	1,500	6	9,000	9	13,500	7	10,500	4	6,000	4	6,000	30	45,000	7	10,500	1	1,500	8	12,000	38	57,000
Belgium		1,800	3,100	3	9,300	2	6,200			5	15,500			10	31,000							10	31,000
Belgium	Nikolay Ostrovskiy	1,800	3,100									2	6,200	2	6,200	3	9,300			3	9,300	5	15,500
Poland	Pervomaysk	1,900	2,500	1	2,500	5	12,500	8	20,000	6	15,000			20	50,000							20	50,000
Finland	Khasan	2,400	3,200	4	12,800	4	12,800	5	16,000	5	16,000	3	9,600	21	67,200	2	6,400			2	6,400	23	73,600
Poland	Chulym	2,600	3,800					4	15,200	3	11,400	2	7,600	9	34,200	6	22,800	9	34,200	15	57,000	24	91,200
East Germany	Kolomna	3,200	4,500					1	4,500	4	18,000	4	18,000	9	40,500	1	4,500			1	4,500	10	45,000
Poland	Donbass	3,800	4,800			1	4,800	4	19,200	5	24,000	6	28,800	16	76,800	10	48,000	15	72,000	25	120,000	41	196,800
Finland	Arkhangel'sk	5,600	7,200			1	7,200					1	7,200	2	14,400	1	7,200	2	14,400	3	21,600	5	36,000
Netherlands	Lena	7,700	7,600							3	22,800			3	22,800			3	22,800	3	22,800	6	45,600
Sixth Five Year Plan (1956-57)																							
Finland	Furmanov	1,800	3,100													1	3,100	2	6,200	3	9,300	3	9,300
Belgium	Stanislavskiy	3,200	5,000													1	5,000	3	15,000	4	20,000	4	20,000
France		5,800	6,200													6	37,200			6	37,200	6	37,200
USSR	GES	5,500	5,000													2	10,000	4	20,000	6	30,000	6	30,000
Total				14	33,600	22	57,000	29	85,400	35	128,700	22	83,400	122	388,100	40	164,000	39	186,100	79	350,100	201	738,200

a. The data in this table were obtained by taking the number of each type of vessel delivered each year from Tables 1 and 2, pp. 6 and 7, respectively, above, and multiplying these numbers by the cargo-carrying capacities of the vessels appearing in Table 3, p. 8, above.
b. In most cases within 100 tons.

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Table 5

Estimated Volume of Dry Cargo Carried by the Soviet Ministry of the Maritime Fleet Showing Shares Performed by the Maritime, Caspian, and Danube Fleets 1950-57 and Plans for 1958-60

Million Metric Tons

Year	(1) Maritime [a]	(2) Caspian Sea [b]	(3) Danube River [c]	(4) Total [d]
1950	14.2	2.1	0.9	17.2
1951	14.7	2.5	1.4	18.6
1952	17.0	3.0	1.5	21.5
1953	18.5	3.4	1.7	23.6
1954	20.9	3.6	1.9	26.4
1955	23.1	3.9	2.0	29.0
1956	24.6	4.4	2.1	31.1
1957	28.3	4.6	2.3	35.2
1958	30.4	4.9	2.5	37.8
1959	32.8	5.1	2.6	40.5
1960	35.0	5.4	2.7	43.1

a. Obtained by subtracting the volumes carried on the Caspian Sea and the Danube River from the total volume.
b. From column 2, Table 9, p. 20, below.
c. From column 2, Table 10, p. 21, below.
d. From column 4, Table 11, p. 22, below.

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Table 6

Estimated Turnover of Dry Cargo Performed by the Soviet Ministry of the Maritime Fleet Showing Shares Performed by the Maritime, Caspian, and Danube Fleets 1950-57 and Plans for 1958-60

Billion Ton-Kilometers

Year	(1) Maritime [a]	(2) Caspian Sea [b]	(3) Danube River [c]	(4) Total [d]
1950	25.0	1.1	1.6	27.7
1951	23.7	1.3	2.2	27.2
1952	26.7	1.6	2.4	30.7
1953	29.5	1.8	2.7	34.0
1954	33.5	1.9	3.1	38.5
1955	39.2	2.1	3.4	44.7
1956	43.2	2.4	3.7	49.3
1957	45.0	2.5	3.6	51.1
1958	49.4	2.6	4.0	56.0
1959	53.1	2.7	4.2	60.0
1960	56.5	2.9	4.4	63.8

a. From column 4, Table 13, p. 25, below.
b. From column 1, Table 13, p. 25, below.
c. Residual.
d. From column 2, Table 12, p. 23, below.

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intercoastal, and foreign trade navigation* and the other according to types of dry cargo, including coal, timber, ore, and grain.

Table 7** presents a breakdown of the volume of cargo carried by the maritime dry cargo fleet into coastal, intercoastal, and foreign trade shipments, with estimates through 1960. Between 1950 and 1960 the percentage share of coastal shipments is planned to rise from 58 to 72 percent of the total and that of intercoastal shipments is expected to rise from 1.4 to 3.1 percent, but the share of foreign trade shipments is expected to drop from 40.8 to 24.6 percent. Even though this drop in percentages has been planned and is expected to occur, the plan also calls for an increase in the actual volume of dry cargo in foreign trade from 5.8 million tons in 1950 to 8.6 million tons in 1960 -- a rise of 48.3 percent.

The most important dry cargo from the point of view of relative volume is coal, which made up 29.7 percent of the 1957 volume of maritime dry cargo. The next 4 in order of their importance in 1957 are as follows: timber, 23.3 percent; ore, 21.6 percent; mineral construction materials (brick, cement, gravel, and so forth), 13.8 percent; and grain, 3.2 percent. With the exception of grain, the percentage shares of all of these cargoes in the total volume of maritime dry cargo have been increasing steadily since 1950. Table 8*** presents a breakdown of the volume of maritime dry cargo into eight classes for the years 1950-60.

* The MMF divides maritime navigation into three classes: coastal, intercoastal, and foreign trade navigation. Coastal navigation involves shipments within the boundaries of any one of the sea basins under the jurisdiction of the MMF such as the Far Eastern or Black Sea basins; intercoastal navigation involves shipments between any two of these basins; and foreign trade navigation involves either import-export shipments terminating or originating in Soviet ports or shipments carried by Soviet ships between foreign ports. 40/

** Table 7 follows on p. 16.

*** Table 8 follows on p. 17.

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Table 7

Estimated Volume of Dry Cargo Carried by the Soviet Maritime Dry Cargo Fleet
by Type of Navigation
1950-57 and Plans for 1958-60

Million Metric Tons

Year	Type of Navigation (1) Coastal [a]	(2) Foreign Trade [b]	(3) Intercoastal [c]	(4) Total [d]
1950	8.2	5.8	0.2	14.2
1951	9.7	4.7	0.3	14.7
1952	12.0	4.6	0.4	17.0
1953	13.4	4.7	0.4	18.5
1954	14.7	5.8	0.4	20.9
1955	16.3	6.4	0.4	23.1
1956	17.6	6.5	0.5	24.6
1957	20.6	7.0	0.7	28.3
1958	22.2	7.4	0.8	30.4
1959	23.8	8.0	1.0	32.8
1960	25.3	8.6	1.1	35.0

a. Obtained by subtracting the volume of Caspian dry cargo in column 2 of Table 5, p. 13, above, from the volumes of coastal cargo in column 1 of Table 14, p. 26, below. This was done assuming that all trade on the Caspian Sea is coastal except for a negligible amount of foreign trade with Iran.

b. Obtained by subtracting the volume of Danube dry cargo in column 3 of Table 5, p. 13, above, from the volumes of foreign trade cargo in column 3 of Table 14, p. 26, below. This was done assuming that all MMF trade on the Danube is considered to be foreign trade.

c. From column 2 of Table 14, p. 26, below. All the volume of intercoastal dry cargo is considered to be maritime.

d. From column 1 of Table 5, p. 13, above.

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Table 8

Estimated Volume of Dry Cargo Carried by the Soviet Maritime Dry Cargo Fleet by Type of Cargo a/ 1950-57 and Plans for 1958-60

Million Metric Tons

	Type of Cargo								
Year	Coal	Ore	Timber	Grain	Mineral Construction Materials	Salt	Seafood	Miscellaneous	Total
1950	3.2	2.4	1.9	1.0	1.0	0.2	0.2	4.3	14.2
1951	3.7	2.9	2.3	0.9	1.4	0.2	0.2	3.1	14.7
1952	4.4	3.6	2.6	0.9	1.6	0.2	0.2	3.5	17.0
1953	5.0	4.2	3.0	0.8	1.6	0.2	0.2	3.5	18.5
1954	5.5	4.8	3.5	0.9	1.8	0.2	0.3	3.9	20.9
1955	6.2	5.5	4.0	0.8	2.0	0.2	0.2	4.2	23.1
1956	7.6	5.8	5.1	0.6	3.7	0.2	0.2	1.4	24.6
1957	8.4	6.1	6.6	0.9	3.9	0.2	0.3	1.9	28.3
1958	9.3	6.8	6.6	0.9	3.8	0.2	0.3	2.5	30.4
1959	10.2	7.5	6.6	1.2	3.9	0.2	0.3	2.9	32.8
1960	11.0	8.0	6.7	1.3	3.9	0.2	0.3	3.6	35.0

a. Data obtained by subtracting data on cargo carried on the Caspian Sea and the Danube River in Tables 16 and 17, pp. 30 and 31, respectively, below, from relevant columns of Table 15, p. 28, below.

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APPENDIX A

STATISTICAL TABLES

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Table 9

Estimated Volume of Cargo Carried on the Caspian Sea
by the Soviet Ministry of the Maritime Fleet
by Major Category of Cargo
1950-57 and Plans for 1958-60

Million Metric Tons

	Category of Cargo		
	(1)	(2)	(3)
Year	POL a/	Dry Cargo b/	Total
1950	10.4	2.1	12.5 c/
1951	11.9	2.5	14.4 d/
1952	13.3	3.0	16.3 d/
1953	14.9	3.4	18.3 e/
1954	14.9	3.6	18.5 f/
1955	15.8	3.9	19.7 g/
1956	16.9	4.4	21.3 h/
1957	17.2	4.6	21.8 i/
1958	17.3	4.9	22.2 i/
1959	17.6	5.1	22.7 i/
1960	17.8	5.4	23.2 j/

a. These figures were obtained by multiplying the figures for the volume of cargo by a series of percentage shares obtained from a straight-line projection based on the known percentage shares of POL in 1947 (85 percent 41/) and 1955 (80 percent 42/).
b. The difference between the total volume and the volume of POL.
c. The 1950 volume of cargo carried by the MMF (33.7 million tons 43/) times the percentage share of the total, which was planned for transport on the Caspian Sea (37.1 percent 44/).
d. Interpolated, using arithmetic progression, between 1950 and 1953.
e. The 1953 volume was 0.2 million tons less than the 1954 volume. 45/
f. The 1954 volume equals 94.1 percent of the 1955 volume. 46/
g. The 1955 volume equals 92.7 percent of the 1956 volume. 47/
h. The 1956 volume of MMF cargo (57.7 million tons 48/) times the percentage share of the total, which was reported to have been transported on the Caspian Sea (37.0 percent 49/).
i. Interpolated, using arithmetic progression, between 1956 and 1960.
j. The 1960 plan figure. 50/

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Table 10

Estimated Volume of Cargo Carried by the Soviet Danube Steamship Company
by Major Category of Cargo
1950-57 and Plans for 1958-60

Million Metric Tons

Year	Category of Cargo (1) POL [a]	(2) Dry Cargo [b]	(3) Total [c]
1950	0.4	0.9	1.3 [d]
1951	0.7	1.4	2.1
1952	0.8	1.5	2.3
1953	0.9	1.7	2.6
1954	0.9	1.9	2.8
1955	1.0	2.0	3.0
1956	1.1	2.1	3.2
1957	1.2	2.3	3.5
1958	1.2	2.5	3.7
1959	1.3	2.6	3.9
1960	1.4	2.7	4.1

a. The share of POL is estimated to be 33 percent of the total.
b. The share of dry cargo is estimated to be 67 percent of the total.
c. With the exception of the figure for 1950, all of these figures were obtained from arithmetic progression using figures for the years 1945 and 1956. From a single source it was ascertained that the 1955 volume was close to 3 million tons and that the 1956 volume was 4 times the 1945 volume. 51/ A figure for 1956 was obtained by multiplying 3 million tons by 107.4 percent, 7.4 being the percentage by which the volume of MMF cargo rose in 1955-56. 52/ The figure for 1956 thus obtained was divided by 4 to get a figure for 1945.
d. The 1950 volume of MMF cargo (33.7 million tons 53/) times the percentage share of the total which was planned for transport on the Danube River (3.7 percent 54/).

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Table 11

Estimated Volume of Cargo Carried by the Soviet Ministry of the Maritime Fleet
by Major Category of Cargo
1950-57 and Plans for 1958-60

Million Metric Tons

Year	Category of Cargo (1) POL	(2) Dry Cargo	(3) Rafted Timber	(4) Total
1950 a/	15.8	17.2	0.7	33.7
1951 a/	16.7	18.6	1.2	36.5
1952 a/	18.4	21.5	1.3	41.2
1953 a/	20.7	23.6	1.2	45.5
1954 a/	20.9	26.4	1.2	48.5
1955 a/	23.0	29.0	1.7	53.7
1956 a/	24.9	31.1	1.7	57.7
1957	28.1 b/	35.2 c/	1.9 d/	65.2 e/
1958	30.3 b/	37.8 c/	2.1 d/	70.2 f/
1959	32.4 b/	40.5 c/	2.2 d/	75.1 g/
1960	34.5 b/	43.1 c/	2.4 d/	80.0 h/

a. 55/
b. Representing 43.1 percent of the annual total (the percentage share is equal to the percentage share of POL in 1956).
c. Representing 53.9 percent of the annual total (the percentage share is equal to the percentage share of dry cargo in 1956).
d. Representing 3.0 percent of the annual total (the percentage share is equal to the percentage share of rafted timber in 1956).
e. The 1957 volume of cargo was 13 percent higher than the 1956 volume. 56/
f. The plan calls for the volume of cargo to increase 7.7 percent above that of 1957. 57/
g. Interpolated between the plan figures for 1958 and 1960.
h. The plan calls for the volume of cargo to increase 49 percent above that of 1955. 58/

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Table 12

Estimated Cargo Turnover of the Soviet Ministry of the Maritime Fleet
by Major Category of Cargo a/
1950-57 and Plans for 1958-60

Billion Ton-Kilometers

Year	Category of Cargo (1) POL	(2) Dry Cargo	(3) Rafted Timber	(4) Total
1950	11.9	27.7	0.1	39.7
1951	12.9	27.2	0.2	40.3
1952	13.3	30.7	0.3	44.3
1953	13.9	34.0	0.3	48.2
1954	17.8	38.5	0.3	56.6
1955	23.9	44.7	0.3	68.9
1956	32.7	49.3	0.4	82.4
1957	40.7 b/	51.1 b/	0.5 c/	92.3 d/
1958	45.2 e/	56.0 f/	0.6 g/	101.8 h/
1959	62.4 e/	60.0 f/	0.6 g/	123.0 i/
1960	80.3 e/	63.8 f/	0.6 g/	144.7 j/

a. Except for the totals, all of the data for 1950-60 were obtained by multiplying volumes of cargo for the three categories by their average lengths of haul. The volumes and average lengths of haul as well as the turnover totals came from a single source. 59/

b. The planned percentage increases for the MMF turnover from 1956 to 1957 were 2.6 percent for dry cargo and 23.6 percent for POL. 60/ Therefore, the planned turnovers were 50.6 billion tkm for dry cargo and 40.4 billion for POL. Because the plan was overfulfilled /footnote continued on p. 24/

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Table 12

Estimated Cargo Turnover of the Soviet Ministry of the Maritime Fleet
by Major Category of Cargo
1950-57 and Plans for 1958-60
(Continued)

by 0.8 billion tkm this amount was prorated between the turnovers for dry cargo and POL, making the final figures 51.1 billion and 40.7 billion tkm, respectively. 61/

c. The difference between the planned total and the planned amounts for dry cargo and POL.

d. 62/

e. For 1958-60 the turnovers for POL were taken as the difference between the estimated totals and the estimated turnovers for dry cargo and rafted timber.

f. For 1958-60 an average length of haul for dry cargo was determined by calculating the average of the average lengths of haul for 1951-56. The volumes for these years (see column 2, Table 11, p. 21, above) were multiplied by the average length of haul (1,481 km) to obtain the turnovers.

g. The turnover for rafted timber is assumed to have leveled off at 0.6 billion tkm for the years 1959 and 1960 after rising 0.1 billion tkm from 1957 to 1958.

h. The 1958 turnover is planned to increase 10.3 percent above the 1957 turnover. 63/

i. Interpolated between the plan figures for 1958 and 1960 by graphic analysis.

j. The 1960 turnover is planned to increase 110 percent above the 1955 turnover. 64/

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Table 13

Calculation of the Maritime Share of the Dry Cargo Turnover
of the Soviet Ministry of the Maritime Fleet
1950-60

Year	(1) Caspian Turnover a/ (Billion Ton-Kilometers)	(2) Combined Danube and Maritime Turnover b/ (Billion Ton-Kilometers)	(3) Combined Danube and Maritime Average Length Haul c/ (Kilometers)	(4) Maritime Turnover d/ (Billion Ton-Kilometers)
1950	1.1	26.6	1,762	25.0
1951	1.3	25.9	1,609	23.7
1952	1.6	29.1	1,573	26.7
1953	1.8	32.2	1,594	29.5
1954	1.9	36.6	1,605	33.5
1955	2.1	42.6	1,697	39.2
1956	2.4	46.9	1,757	43.2
1957	2.5	48.6	1,588	45.0
1958	2.6	53.4	1,623	49.4
1959	2.7	57.3	1,619	53.1
1960	2.9	60.9	1,615	56.5

a. Obtained by multiplying the figures for volume in column 2 of Table 9, p. 20, above, by the figure for the average length of haul (536 km), the 1935 average length of haul for dry cargo on the Caspian Sea. 65/ This figure for the average length of haul is almost the same as the figure calculated from a Soviet chart diagramming the 1953 movement of dry cargo on the Caspian Sea. 66/

b. Obtained by subtracting the figures for Caspian Sea dry cargo turnover in column 1 of this table from the figures for dry cargo turnover of the MMF in column 2 of Table 12, p. 23, above.

c. Obtained by dividing the combined Danube River and maritime dry cargo turnovers in column 2 of this table by the combined Danube River and maritime volumes from columns 1 and 3 of Table 5, p. 13, above.

d. Obtained by multiplying the figures for average length of haul in column 3 of this table by the maritime dry cargo volume in column 1 of Table 5, p. 13, above.

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Table 14

Estimated Total Volume of Dry Cargo Carried by the Soviet Ministry of the Maritime Fleet by Type of Navigation 1950-57 and Plans for 1958-60

Million Metric Tons

Year	Type of Navigation (1) Coastal	(2) Intercoastal	(3) Foreign Trade	(4) Total [a]
1950	10.3 [b]	0.2 [c]	6.7 [d]	17.2
1951	12.2 [b]	0.3 [e]	6.1 [d]	18.6
1952	15.0 [b]	0.4 [e]	6.1 [d]	21.5
1953	16.8 [b]	0.4 [e]	6.4 [d]	23.6
1954	18.3 [b]	0.4 [f]	7.7 [d]	26.4
1955	20.2 [b]	0.4 [g]	8.4 [d]	29.0
1956	22.0 [b]	0.5 [h]	8.6 [d]	31.1
1957	25.2 [i]	0.7 [h]	9.3 [j]	35.2
1958	27.1 [i]	0.8 [h]	9.9 [j]	37.8
1959	28.9 [i]	1.0 [h]	10.6 [j]	40.5
1960	30.7 [i]	1.1 [k]	11.3 [l]	43.1

a. See column 1, Table 11, p. 22, above.

b. 67/

c. In the plan for 1950, the volume of intercoastal cargo was to be 1 percent of the total of cargo carried by the MMF (including dry cargo, POL, and rafted timber), or approximately 0.3 million tons. 68/ In the plan, intercoastal and foreign cargoes together were to make up /footnote continued on p. 27/

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Table 14

Estimated Total Volume of Dry Cargo Carried by the Soviet Ministry of the Maritime Fleet
by Type of Navigation
1950-57 and Plans for 1958-60
(Continued)

30 percent of the total; they actually made up only 20 percent. 69/ For this reason it was assumed that the volume of intercoastal cargo for 1950 was only two-thirds of the amount planned, or 0.2 million tons. Because the volume of intercoastal shipments of POL at this time was negligible, it was assumed that the entire intercoastal volume consisted of dry cargo.

d. Obtained by subtracting the volumes of coastal and intercoastal cargoes from the total.

e. Interpolated, using arithmetic progression between 1950 and 1954.

f. In 1954, 1.4 percent of the volume of dry cargo carried by the MMF was moved in intercoastal trade. 70/

g. The volume of dry cargo carried by the MMF in intercoastal trade rose 10 percent from 1954 to 1955. 71/

h. Interpolated, using arithmetic progression between 1955 and 1960.

i. Obtained by subtracting the volumes of intercoastal and foreign cargoes from the total.

j. Interpolated, using arithmetic progression between 1956 and 1960.

k. The percentage increase in the volume of intercoastal dry cargo in 1955-60 was determined to be 170 percent. The increase was determined as follows: intercoastal trade in POL out of the Black Sea, which includes close to 100 percent of the MMF volume of intercoastal POL, was planned to increase 230 percent. 72/ Intercoastal trade in POL and dry cargo together for the MMF was planned to increase 200 percent. 73/ Using 0.4 million tons as the 1955 volume for dry cargo, the same figure for POL, 74/ and the two above known percentage increases for POL and for POL and dry cargo together, the percentage increase for dry cargo alone was extrapolated.

l. The percentage increase in the volume of foreign trade dry cargo in 1955-60 was determined to be 135 percent. The increase was determined as follows: foreign trade in POL carried by tankers of the Black Sea fleet, which carry close to 100 percent of the MMF volume of foreign trade in POL, was planned to increase 140 percent. 75/ The MMF volume of foreign trade in POL and dry cargo together was planned to increase 70 percent. 76/ Using 8.4 million tons as the 1955 volume of dry cargo and assuming that the volume of POL was one-half of this amount, or 4.2 million tons, the percentage increase for dry cargo alone was extrapolated.

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Table 15

Estimated Volume of Dry Cargo Carried by the Soviet Ministry of the Maritime Fleet
by Type of Cargo
1950-57 and Plans for 1958-60

Million Metric Tons

Year	Type of Cargo								
	Coal	Ore	Timber in Ships	Grain	Mineral Construction Materials	Salt	Seafood	Miscellaneous	Total
1950	3.4 a/	2.7 a/	2.3 a/	1.5 a/	1.2 b/	0.3 b/	0.2 b/	5.6	17.2
1951	4.0 c/	3.4 c/	2.8 c/	1.5 c/	1.7 b/	0.3 b/	0.2 b/	4.7	18.6
1952	4.7 c/	4.2 c/	3.3 c/	1.6 c/	2.0 b/	0.3 b/	0.2 b/	5.2	21.5
1953	5.4 c/	4.8 c/	3.8 c/	1.6 c/	2.1 b/	0.3 b/	0.2 b/	5.4	23.6
1954	6.0 c/	5.6 c/	4.3 c/	1.7 c/	2.3 b/	0.3 b/	0.3 b/	5.9	26.4
1955	6.7 a/	6.3 a/	4.8 a/	1.7 a/	2.6 b/	0.3 b/	0.2 b/	6.4	29.0
1956	8.2 d/	6.6 e/	6.0 d/	1.9 f/	4.4 b/	0.3 b/	0.2 b/	3.5	31.1
1957	9.1 g/	7.1 h/	7.6 i/	2.2 f/	4.6 j/	0.3 k/	0.3 l/	4.0	35.2
1958	10.0 g/	7.8 m/	7.7 m/	2.4 f/	4.7 n/	0.4 o/	0.3 l/	4.5	37.8
1959	11.0 g/	8.6 m/	7.8 m/	2.7 f/	4.8 n/	0.4 o/	0.3 l/	4.9	40.5
1960	11.9 p/	9.3 p/	7.9 p/	2.9 p/	4.9 n/	0.4 o/	0.3 l/	5.5	43.1

a. Average of total shipped and total received. 77/
b. These are minimum figures representing cargoes carried in coastal trade only. 78/
c. Interpolated, using arithmetic progression between 1950 and 1955:
d. 79/
e. 80/
f. Interpolated, using arithmetic progression between 1955 and 1960.

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Table 15

Estimated Volume of Dry Cargo Carried by the Soviet Ministry of the Maritime Fleet
by Type of Cargo
1950-57 and Plans for 1958-60
(Continued)

g. Interpolated, using arithmetic progression between 1956 and 1960.
h. 81/
i. 82/
j. Planned increase for 1956-57. 83/
k. Assumed to have remained constant through 1957.
l. Assumed to have leveled off at 0.3 million tons for 1957-60. The total increase planned for 1955-60 equals 73 percent. 84/
m. Interpolated, using arithmetic progression between 1957-60.
n. Assumed to increase 0.1 million tons each year from 1958 to 1960.
o. Assumed to increase 0.1 million tons from 1957 to 1958 and level off thereafter.
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Table 16

Estimated Volume of Dry Cargo Carried by the Soviet Danube Steamship Company by Type of Cargo a/
1950-57 and Plans for 1958-60

Million Metric Tons

Year	Type of Cargo					
	Ore	Grain	Coal	Mineral Construction Materials	Miscellaneous	Total
1950	0.2	0.2	0.2	0.1	0.2	0.9
1951	0.4	0.2	0.3	0.2	0.3	1.4
1952	0.5	0.2	0.3	0.2	0.3	1.5
1953	0.5	0.2	0.4	0.2	0.4	1.7
1954	0.6	0.2	0.5	0.2	0.4	1.9
1955	0.6	0.2	0.5	0.2	0.5	2.0
1956	0.6	0.2	0.6	0.2	0.5	2.1
1957	0.7	0.2	0.7	0.2	0.5	2.3
1958	0.7	0.3	0.7	0.3	0.5	2.5
1959	0.8	0.3	0.8	0.3	0.4	2.6
1960	0.9	0.3	0.9	0.3	0.3	2.7

a. This table represents an estimated breakdown of the volume of dry cargo carried by the Soviet Danube Steamship Company presented in column 3 of Table 5, p. 13, above. The types of cargo listed were selected on the basis of the following statement: "The most important goods carried /by the Soviet Danube Steamship Company/ are: iron ore, bauxite, grain, tobacco, coal, cement, sugar, factory equipment, and oil." 86/ The relative proportion and increase for each type of cargo was determined by an analysis of the magnitude and growth shown in Table 15, p. 28, above, and known information on overall dry cargo volume of the Soviet Danube Steamship Company.

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Table 17

Estimated Volume of Dry Cargo Carried on the Caspian Sea
by the Soviet Ministry of the Maritime Fleet
by Type of Cargo a/
1950-57 and Plans for 1958-60

Million Metric Tons

Year	Type of Cargo						
	Ore	Timber in Ships	Grain	Mineral Construction Materials	Salt	Miscellaneous	Total
1950	0.1	0.4	0.3	0.1	0.1	1.1	2.1
1951	0.1	0.5	0.4	0.1	0.1	1.3	2.5
1952	0.1	0.7	0.5	0.2	0.1	1.4	3.0
1953	0.1	0.8	0.6	0.3	0.1	1.5	3.4
1954	0.2	0.8	0.6	0.3	0.1	1.6	3.6
1955	0.2	0.8	0.7	0.4	0.1	1.7	3.9
1956	0.2	0.9	1.1 b/	0.5	0.1	1.6	4.4
1957	0.3	1.0	1.1	0.5	0.1	1.6	4.6
1958	0.3	1.1	1.2	0.6	0.2	1.5	4.9
1959	0.3	1.2	1.2	0.6	0.2	1.6	5.1
1960	0.4	1.2	1.3	0.7	0.2	1.6	5.4

a. This table represents an estimated breakdown of the volume of dry cargo carried on the Caspian Sea presented in column 2 of Table 5, p. 13, above. The types and volumes of cargo listed were determined on the basis of the following information: during 3 prewar years (1932, 1934, and 1935), the 4 most important dry cargoes in order of their importance were timber, grain, mineral construction materials, and salt. 87/ Timber, salt, cotton, and chemicals were described in a 1947 source as the main dry cargoes on the Caspian Sea. 88/ A 1954 source listed timber, grain, salt, and cotton as the most important cargoes and included mineral construction materials as a minor cargo. 89/ A 1954 source identified ore as a minor dry cargo on the Caspian Sea and indicated a rising volume of shipments of mineral construction materials. 90/ The breakdown of the over-all MMF volume of dry cargo presented in Table 15, p. 28, above, was used as an additional guide to the relative volumes of each type of cargo.

b. 91/

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APPENDIX B

METHODOLOGY

For the purposes of this research aid, the Soviet maritime dry cargo fleet has been defined as that portion of the dry cargo fleet of the MMF consisting of self-propelled vessels of more than 1,000 GRT except those assigned to the Danube River, Central Asiatic, Caspian, and Caspian Roadstead steamship companies. The concern of the report is with the fleet itself (size, composition, expansion in 1951-60, and disposition) and with its performance (volume of cargo in tons and cargo turnover in ton-kilometers).

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The major problems involved in writing this research aid reflect the nature of available source material. The principal sources available for the study of the fleet itself are [redacted] published and unpublished ONI data on vessels, and statements in the Soviet press and Soviet technical literature concerning the size and expansion of the fleet. The only real difficulty in using the data from Lloyd's and ONI is that neither makes any distinction between vessels subordinate to the MMF and those subordinate to the Ministry of the Fishing Industry. For this reason, ONI figures on numbers and cargo-carrying capacities of dry cargo vessels often have to be decreased to exclude vessels of the Ministry of the Fishing Industry, fish factory vessels, and refrigerator vessels. The difficulty in using Soviet statements on the size and expansion of the fleet is that such statements usually refer to the dry cargo and tanker fleets together, including vessels on the Danube River and the Caspian Sea.

A similar problem exists in the case of the performance of the fleet, where the major source of information is also statements from the Soviet press and Soviet technical literature. Over-all figures on performance for the Ministry of the Maritime Fleet are readily available. The problems arise in attempting to arrive at figures concerned only with the maritime dry cargo fleet as defined in this report and in attempting to break these figures down by type of cargo or class of navigation (coastal, intercoastal, and foreign). Estimates had to be made of the volumes and turnovers of dry cargo of the Soviet Danube Steamship Company and in the Caspian Basin. (See Tables 9, 10, and 13.*) These estimated figures were then subtracted from the total volumes and turnovers for the MMF as a whole (see Tables 11 and 12**) to obtain the volumes and turnovers for the maritime segment of the MMF dry cargo fleet. (See Tables 5 and 6.***)

* Pp. 20, 21, and 25, respectively, above.
** Pp. 22 and 23, respectively, above.
*** Pp. 13 and 14, respectively, above.

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A similar procedure was used in determining the breakdowns of the maritime dry cargo volume by class of navigation and by cargo type. (See Tables 7 and 14* for the exact methodology used in determining the breakdown by class of navigation and Tables 8, 15, 16, and 17** for that used in determining the breakdown by cargo.)

* Pp. 13 and 14, respectively, above.
** Pp. 17, 28, 30, and 31, respectively, above.

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APPENDIX C

GAPS IN INTELLIGENCE

It is possible to pinpoint gaps in intelligence in the cases of both the Soviet maritime dry cargo fleet itself and its performance. When statements from the Soviet press regarding increases in the over-all cargo-carrying capacity of the fleet are used in attempting to arrive at an accurate figure for fleet size, it is never certain what sizes or types of vessels are being included in the Soviet count or at what precise time the count was made. In this particular report, the lack of reliable information either on a vessel-by-vessel basis or on an over-all basis regarding the size and composition of the Soviet fleets on the Danube River and the Caspian Sea included in MMF totals made it impossible to utilize such statements from the Soviet press. A further difficulty to this approach is the lack of knowledge either of retirements of specific vessels or of annual rates of retirement from the MMF fleet. The method used, a vessel-by-vessel compilation of the fleet size and cargo-carrying capacity using Lloyd's and ONI sources, suffers, on the other hand, from the fact that reporting from certain areas where units of the Soviet maritime fleet are active, such as the Far East and the Northern Sea Route, is incomplete.

In the case of fleet performance, where over-all volume of dry cargo and turnover data for the MMF were easily obtainable, the problem was one of using piecemeal data to estimate the performance figures for the Danube and Caspian fleets needed to determine maritime performance. There is very little information available from which to determine MMF volume of cargo, cargo breakdown, and cargo turnover on these bodies of water. In establishing a breakdown of volume of dry cargo into cargoes carried in coastal, intercoastal, and foreign trade navigation, reliable data were available for the volume moved in coastal navigation in the years 1950 and 1955. The difference, however, between the total volume and the coastal volume had to be prorated between intercoastal and foreign trade navigation on the basis of data which again were piecemeal.

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APPENDIX D

SOURCE REFERENCES

Evaluations, following the classification entry and designated "Eval.," have the following significance:

Source of Information	Information
Doc. - Documentary	1 - Confirmed by other sources
A - Completely reliable	2 - Probably true
B - Usually reliable	3 - Possibly true
C - Fairly reliable	4 - Doubtful
D - Not usually reliable	5 - Probably false
E - Not reliable	6 - Cannot be judged
F - Cannot be judged	

"Documentary" refers to original documents of foreign governments and organizations; copies or translations of such documents by a staff officer; or information extracted from such documents by a staff officer, all of which may carry the field evaluation "Documentary."

Evaluations not otherwise designated are those appearing on the cited document; those designated "RR" are by the author of this report. No "RR" evaluation is given when the author agrees with the evaluation on the cited document.

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